in the accumulation and tabulation of replies to its circular letter relative to photographs of Halley's comet. From these replies there has been constructed a card catalogue exhibiting in chronological order the material available for a photographic history of this comet during its appearance of 1910. At present this catalogue consists of about a thousand titles, but it can not be regarded as complete, owing to the absence of reports from several important sources.

Correspondence is being conducted in the endeavor to supply as far as may be the missing data, but it is already apparent that the existing gaps can not be completely filled. A period of very great activity in photographing the comet accompanies the date of its nearest approach to the earth, but this is preceded by an epoch of comparative neglect and is followed, in July, 1910, by an apparently complete cessation of photographic work upon the comet, continuing until December, when some exposures were made at the Lick Observatory and reported to the committee. It is earnestly hoped that these lacunæ will be filled by observations not yet reported to the committee.

As soon as the card catalogue can be regarded as reasonably complete it is the purpose of your committee to select from it such data for reproduction as will best serve its purpose of constructing a graphic history of the comet's appearance in the years 1909–10.

Report of the Committee on Photographic Astrometry: F. Schlesinger (chairman).

The chairman reported briefly on the progress made since the meeting at Ottawa four months earlier, at which a full report had been read. It appears that the most immediate duty of this committee is to study the movements of a pier during the course of a night, and if possible to devise some method by which a pier can be kept stationary within small amounts. For this purpose a 10-inch photographic telescope of 100 inches focal length has been constructed, and is now being mounted upon a pier at the Allegheny Observatory. The pier and telescope are to be kept at a nearly constant temperature in a basement room at the observatory. At frequent intervals throughout the night, short exposures are to be made upon the region of the pole, access to this part of the sky being obtained through a window of plane parallel glass. Dr. Schlesinger also referred briefly to the progress made by Dr. Ross with the photographic zenith-tube designed by the latter and mounted by him at the International Latitude Station at Gaithersburg. The material thus far secured indicates a considerable reduction in accidental errors, as compared with the best work of the zenith telescope by Talcott's method. This instrument had been in operation during a few months only, and consequently no information is as yet forthcoming as to the freedom of the method from systematic error.

A verbal report by Professor C. L. Doolittle, chairman of the committee on cooperation in the teaching of astronomy, was followed by an extended and profitable discussion.

Late in the afternoon of Friday, December 29, the society adjourned to reassemble at the Allegheny Observatory, Pittsburgh, in the following August.

R. H. Curtiss,
Editor for the Meeting

Ann Arbor,
February, 1912

Societies and Academies

The Academy of Science of St. Louis

The meeting of the Academy of Science of St. Louis was held at the Academy building on Monday, March 18, 1912, at 8 P.M., President Engler in the chair.

Professor C. A. Waldo, of Washington University, addressed the academy on "The Problems of Coal Exhaustion."

"Miniature Flint Arrows" was the subject of a short paper by Dr. H. M. Whelpley, who illustrated his remarks with over 2,000 specimens, varying in length from .06 to 1 inch. In form they represent all of the common types of ordinary arrows and were evidently made by the same process of pressure chipping. Specimens have been found in England, Spain, Belgium, India, Palestine, Egypt and the United States. These artifacts belong to the Neolithic age. It has been suggested, but without evidence, that they were made by a pygmy race of human beings. It is also claimed that they were barbs for harpoons, tattooing instruments, fish snags or drills for skin and shell work. Dr. Whelpley concludes that the medium size and larger miniature arrows, such as are very plentiful along portions of the Missouri and Meramec Rivers, were used as arrow heads. The most minute ones he considers examples of skill in flint chipping, the same as the miniature baskets made by the Pomo Indians to-day are merely examples of skill in basketry.

Dr. R. J. Terry reported on "A Grove of Deformed Trees."

A grove of four or five hundred small persimmon trees in St. Louis County has suffered from the ravages of a beetle which has been identified as *Oncideres cingulata*. Limbs varying in diameter from 5 to 15 mm. are girdled and the ends fall to the ground. All the trees, old and young, have been attacked. The girdling is done in the fall, mainly in September and October. During this time the larger trees present scores of branches bearing dead leaves and the ground is strewn with fallen branches often laden with fruit. There is no tree in the grove that does not present crooked trunk and limbs. The deformities in some cases are extreme. Most of the trees are as a consequence dwarfed, although able to make some advance in growth. Some trees only a meter and half tall bore fruit in 1911.

A few beetles have been observed working. The cut was begun on the upper side of the branch and was made 3–4 mm. wide and about 3 mm. deep. Most of the limbs fall, probably within a few days after the girdling. A small proportion remain throughout the following winter. On every severed branch, near the distal ends of the twigs, one or more small deep excoriations of the bark were found. That the beetle makes similar abrasions of the bark of twigs of the honey locust is known from observation on *Oncideres* in captivity. Limbs recovered from the ground in winter in some cases presented no evidence of the propagation of the beetle, whereas in others more or less of the wood had been destroyed under the bark along one side of the branch extending from the distal end proximally. The cavity never quite reached the proximal severed end. Larvæ which are now being studied were discovered in some of the tunnels.

AT the meeting of the Academy of Science of St. Louis, held at the Academy building, March 4, 1912, Dr. Charles A. Todd addressed the academy on "A Problematical Geological Phenomenon in Colorado."

In the Estes Park district of Colorado there is a remarkable collection or aggregation of rocks, the exact nature of which at present is undetermined. This geological puzzle is in the form of an oblong pit with sides sloping at an angle of 45° and meeting at the bottom. Its length is 600 feet; width, 200; depth, 50. These measurements are only estimates. At the eastern extremity of this oblong is a circular pit 150 feet in diameter. Both pits have the same general characteristics. Their walls are of more or less cubical masses of country granite, sharp angled and solidly jammed together for the most part. The largest blocks are on the upper part of the wall; one I judged to be 30×40 feet with irregular thickness. These pits are in the valley of Fern Lake on a branch of the Thompson River and about three miles from the Continental Divide. They are on the right-hand side of Fern Lake, forming part of the shore. All this district has been subject to glacial action and this valley gives all indication of having been plowed out by the ice. Fern Lake is a circular glacial lakelet about one fourth of a mile in diameter and said to be 75 feet deep. Its shores drop off abruptly with the depths. Just above the lake is a bench extending two miles up stream to another and larger glacial lake. At the lower end of Fern Lake is a terminal moraine, filling the valley (which is here about three fourths of a mile wide) and extending down stream two miles, where the main Thompson flows through a rather wide cañon. The question is, how came these rocks here and so arranged. Two theories are advanced: One is that the pits represent a "blow-out." In that case the applied force must have been gaseous, since there is no lava or ash in the neighborhood. The second theory is that the rocks are glacial deposit. They are, as stated, in the course of the ice stream and next an extensive moraine. But the peculiar configuration of the pits, the sharp angles of the cubical fragments, etc., seem to oppose this view. The surest way to settle the matter evidently would be to sink a shaft in the bottom of the main pit and determine whether or not the broken rock extends well below the general level of the valley at that point.

Dr. H. T. A. Hus, of the University of Michigan, read a paper on "Inheritance in *Capsella*."

Professor Nipher made a verbal communication concerning some of his more recent work on the nature of the electric discharge. Former results of his work seem to point very strongly to the one-fluid theory. It would follow that the two waves which were shown to exist in the Wheatstone experiment were compression and rarefaction waves. The negative wave is in the nature of a supercharge which travels along on the outer surface of a thin outer film of the conductor. The positive wave is one in which a thin outer film of the wave is suddenly drained of the negative charge, at the instant of passing of the wave. We had been led to suspect as a result of recent experiments that

matter in this latter condition is explosive. The tests have been made on thin fuse wires sealed into long glass tubes through which the wire passes. The wires were sealed in by means of hard sealing wax. A discharge from a battery of Leyden jars was passed through the wires. The disintegration of the wires is much greatest at the positive end. The sealing wax, wire and glass tube in almost every case, break down at that end. The lead is dispersed in a fine powder or dust.

Professor Nipher remarked that he had just found in the London *Phil. Mag.*, Vol. 46, of 1815, pp. 161 and 259, an account of the work of De Nelis and Singer, who passed a positive discharge through a lead wire of 0.01 inch diameter contained in an iron tube. The wall of the tube was usually about 0.14 inch in thickness. In one case the tube was one inch in external diameter, with a small bore admitting a steel needle with wax insulation and terminating in the short lead wire resting on the bottom. The lead wire was surrounded by oil. Such tubes were burst by repeated explosions of the lead wire, which required to be replaced at each discharge. The discharge was from a battery of Leyden jars having an area of from 75 to 100 square feet. The needle and part of the liquid were thrown out at each explosion. In some cases the liquid was thrown to a height of 40 feet. The experimenters do not seem to have used the negative discharge. They attributed the effects to the expansive power of the electric fluid.

What they were doing was to suddenly drain that lead wire of the negative fluid. The atoms of lead then repel each other. Some of the effect is of course a heat effect. The question arises, however, will the negative discharge produce a like or an equal effect? Is it not possible that such molecular repulsion is primarily concerned in the formation of disruptive channels in air and resulting in spark discharges and lightning?

George T. Moore,
Corresponding Secretary

The Botanical Society of Washington

The 79th regular meeting of the society was held at the Shoreham Hotel, Tuesday, March 5, 1912, at 8 o'clock P.M. President W. A. Orton presided. This being the annual open meeting the program was devoted to an address on "The Present Status of the Genetics Problem," by the retiring president, Professor W. J. Spillman. The address will appear in Science.

The 80th regular meeting was held at the Cosmos Club, Tuesday, April 2, 1912, at 8 o'clock P.M. President W. A. Orton presided. Eighteen members were present. Dr. Errett Wallace and Messrs. L. H. Evans, S. M. McMurran and S. C. Stuntz were admitted to membership.

The following papers were read:

Studies on European Herbaria with Special Reference to Preservation of Type Specimens: Walter T. Swingle.

The speaker on recent visits to the principal European herbaria was impressed by their lack of the geographic limitations, so common in American herbaria. However, the management is much the same as it was a century ago. There is no adequate correlation of the seed and fruit collections with the plants in the herbaria. Alcoholic specimens scarcely exist, and such as are found are neither well indexed nor referred to on the specimen sheets.

The method generally followed at present of leaving types along with the other specimens is certain to lead to their rapid deterioration and ultimate loss. Provision should be made for saving fragments which may drop from the specimen and to this end it was suggested that a sheet of transparent paper be pasted to the back of the herbarium sheet, bending over it, thereby protecting the specimen. Smaller types and fragments of types can be preserved in pasteboard boxes with a glass top, the specimens being pressed against the glass by layers of cotton batting.

It is important to recognize that in plants type specimens can often be indefinitely multiplied by cutting branches from the same plant, or by securing flowers or fruits from the same plant during successive years. These types which are secured from the same plant individual are termed merotypes.

The Celebration of the One Hundredth Anniversary of the Academy of Natural Sciences of Philadelphia: W. E. Safford.

Mr. Safford, the delegate of the Botanical Society at the academy's centenary celebration, gave a graphic and comprehensive report of the meetings and made special mention of the papers of botanical interest there presented. The speaker also gave an account of the development and resources of the academy's herbarium.

W. W. Stockberger,
Corresponding Secretary